

REMARKS/ARGUMENTS

Claims 19-25 were initially pending in this application. In response to a restriction requirement **Claims 20-22** were previously withdrawn as drawn to a non-elected species. Applicants reserve the right to reinstate said claims in the event a generic claim becomes allowable (e.g., Claim 19). **Claims 26-30** were added previously. **Claims 19, 23, & 26** have been amended herein and **Claims 31 & 32** have been added to more clearly claim certain subject matter. No new matter has been entered. Accordingly, **Claims 19 and Claims 23-32** are currently pending in the application. The applicants hereby request entry and consideration of the following amendments and remarks. Reconsideration and allowance are hereby requested.

Rejections Under 35 U.S.C. § 102

Claim 19 has been rejected under 35 U. S. C. §§ 102(a) as being unpatentable over *Zhao* (USPN 6,198,170). This rejection will be discussed in detail below.

Zhao teaches a conductive layer 500 comprising conductive strip 502 having openings D or 504. Then a conductive layer 600 is overlaid directly on top of the conductive strip 500 (i.e., 502). *Zhao* does not teach "forming, over the pad layer, a dielectric layer having a plurality of elongate openings ...configured to extend into the dielectric layer to a depth such that substantial portions of the sidewalls of the elongate slots of the copper-containing pad layer are exposed, thereby enabling electrical connections to the underlying copper-containing pad layer". Nor does *Zhao* teach "forming elongate copper-containing contacts in the plurality of elongate openings" so that the "contacts physically contacting the exposed portions of the sidewalls ... establishing electrical connections to the underlying copper-containing pad layer". The *Zhao* dielectric D is formed in the openings of the conductive layer only. The dielectric D of *Zhao* is not formed on top of the conductive strip 502 but between the openings 504 in the conductive layer 500.

Additionally, the *Zhao* dielectric does not contain "elongate openings ...configured to extend into the dielectric layer to a depth such that substantial portions of the sidewalls of the elongate slots of the copper-containing pad layer are exposed". *Zhao* simply does not teach openings configured to expose substantial portions of the sidewalls of the pad layer as is the case in amended Claim 19. Accordingly, it is respectfully submitted that the cited art is insufficient to establish an anticipation rejection of **Claim 19** under §102. Accordingly, the applicants respectfully request that this rejection of Claim 19 be withdrawn.

Rejections Under 35 U.S.C. § 103(a)

Claims 23-25 are rejected under 35 U. S. C. § 103 as being unpatentable over *Zhao* (as applied to Claim 19) in view of *Colgan et al.* (USPN 5,565,707) (hereinafter *Colgan*). For at least the reasons explained above with respect to Claim 19, the applicants respectfully submit that the *Zhao* reference is inapplicable to the present invention. Accordingly, for at least that reason, the cited combination of references fails to establish a prima facie case of obviousness as to dependent Claims 23-25.

However, the applicants would additionally like to point out that the feature of *Colgan* Fig. 2 identified in the Office Action (at page 4, 1st paragraph) is not an the now claimed exposure of a substantial portion of the sidewall. Instead, the depicted feature of *Colgan* is an undesirable overetch artifact exposing a trivial (i.e., not substantial) portion of the sidewall 30,47. Given the state of the art in the early and middle 1990's it is important to point out that the depicted overetch is an unintentional artifact of etch processes of that time. It is notable that the depicted overetched portion is not pointed out in *Colgan* or in anyway identified as a desirable feature. In fact, there is no lead line or identifying number associated with the residual (and undesirable) overetch feature. Quite simply, Fig. 2 depicts an undesirable artifact of an outdated etch process. The amendments to Claims 19 & 26 more clearly identify the distinction between the intentional (and "substantial") sidewall exposure and the accidental overetch in the cited art. This is important because the substantial sidewall contact enhances the electromigration resistance of the claimed resultant electrical interconnect structure.

In view of the foregoing, the applicants respectfully submit that the cited combination of references fail to establish a prima facie case of obviousness as to Claims 23-30. Accordingly, the applicants respectfully request the withdrawal of ground for rejection.

Added Claims:

The applicants have added Claims 31-32. Claims 31-32 are drafted to specifically point out and further elaborate upon the distinctions explained above. In particular, the exposed sidewall is now claimed as extending "to a depth that extends all the way down to the underlying semiconductor substrate". Thus, there is no mistaking the unintentional etch artifact of the cited art for the intentional substantial sidewall exposure of the cited art. Also, these new claims do not present new matter. Support for these added claims can be found throughout the Specification and Drawings. For example, reference to Figs. 4(a)-4(d) and the supporting portions of the Specification is made.

Conclusion:

In view of the foregoing amendments and remarks, it is respectfully submitted that the claimed invention as presently presented is patentable over the art of record and that this case is now in-condition for allowance.

It is believed that this case is very near allowance. The applicants respectfully request that the Examiner contact the undersigned to discuss any issues arising out of this amendment in an effort to telephonically resolve any such issues. Moreover, if the Examiner has any continuing concerns regarding this case, he is invited to contact the undersigned at (650) 961-8300.

Respectfully submitted,

BEYER WEAVER & THOMAS, LLP



Francis T. Kalinski II
Registration No. 44,177

P.O. Box 70250
Oakland, CA 94612-0250
Telephone: (650) 961-8300